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THE REVIEW

DEVOTED TO THE INTERESTS OF THE AMERICAN SOCIETY FOR METALS

Volume VIII | JANUARY, 1935 | No. 1

Brass Fabrication; Merits of "Chili" Copper Debated

Reported by Ernest O. Olds

New Jersey Chapter, Dec. 10—About 125 members and guests were present at the Hotel Elton in Newark to hear E. L. Bradley, manager, Commercial Research Department, Chase Companies, Waterbury, Conn., speak on "Fabrication of Parts From Copper and Copper Alloys."

Mr. Bradley, who has long been active in the development of technique for copper fabrication, outlined briefly the history of the copper industry, stating that brass alloys were first rolled in the Waterbury district in 1802 for buttons and clock parts. Many interesting samples were displayed or described, ranging from a small pencil sharpener to large drawn and welded or cast pieces. An exceptionally beautiful cold drawn chromium plated tea set of latest design was displayed and brought forth many complimentary remarks.

During the talk and discussion, it was brought out that a soap solution lubricant was used in drawing and a mineral oil in spinning. The continuous electric muffle furnace was best for bright annealing which should be done at a temperature of 1300 to 1400°, the time depending upon the size of the piece being annealed.

The presence of lead aids in the machinability of the brass alloy.

James B. Mudge, metallurgist for Western Electric Co., asked what special or mysterious properties have caused O.F.H.C. Chili copper to be considered especially good. Mr. Bradley does not believe there is any inherent property in Chili copper not to be found in other copper of same quality. Dr. S. Skowronski, metallurgist for the Nichols Copper Co., added that while the high grade commercial copper contains about 0.01% impurities, the "Chili" copper, which is produced by electrolysis direct without a refining process, contains approximately 0.005% impurities.

Shipyards Visited in Joint Boston Inspection Trip

Reported by Howard E. Handy

Boston Chapter, Nov. 2—A plant visitation at the Bethlehem Shipbuilding Corp., Quincy, Mass., was held jointly with the Boston section of the American Welding Society. During an afternoon trip through the various departments (fabricating and machine shops, foundry, annealing room, and so on), opportunity was given to see the several U. S. Naval vessels under construction.

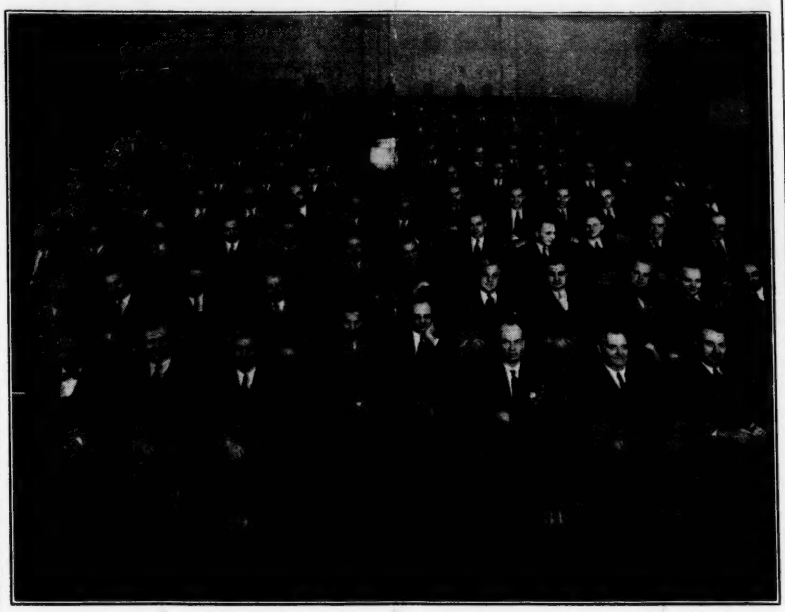
Dinner was served in the company's attractive dining room at 6:30 with the U. S. Naval construction officers and officials of the Yard as guests of the Societies.

Following dinner, John E. Burkhardt, the Corporation's chief engineer, gave a very interesting talk entitled "Some Experiences in Shipbuilding," in which he gave a ship designer's opinion of the various metals used in ship construction.

Guest speaker of the evening was Prof. Comfort Adams of Harvard University, whose subject was welding. Professor Adams, who is widely known for his activities in the field of industrial welding, gave a very interesting discourse on the various types of welding and their applications.

The visitation and meeting were under the general direction of John P. Walsted, assisted by E. B. Ashworth and A. D. Bach.

A Class in Milwaukee on a Rainy Night



Cast Iron Specifications Bring Foundry Problems

Reported by Frank J. Allen

York Chapter, Nov. 7—The heat treatment of cast iron, a matter of constantly increasing interest, was the subject presented by J. S. Vanick of International Nickel Co. His talk, which is shortly to appear in *Metal Progress*, drew forth a great deal of questioning during the discussion period.

Howard Horner began it around the specification of cast irons similar to the S.A.E. steels. Mr. Vanick was sure the day of such standard specifications was fast approaching, but the problem is somewhat different. Foundry variables, such as method of molding, enter acutely into the nature of the resultant iron and its ability to react to heat treatment. The specifications would probably give required physicals and recommended practice, leaving composition and actual procedure to the foundryman.

When Floyd Whalen brought up the comparative liability to cracking in the quench of cast iron and steel, it was pointed out that cast iron cracked more easily, since the hardening extended clear through the section. Mr. Vanick added that oil was a better quenching medium than water.

Taking up the question of hardening by alloying, John Bennett said the mixture should run to a low carbon, since high carbon would tend to give an open grain structure. John also questioned the practice of melting irons for heat treating in the cupola unless a forehearth or mixing ladle is used to insure uniform results.

Replying to Frank Rushong on the control of chill depth in plain cast iron, Mr. Vanick said that chromium is used to build up, and silicon to check the depth of chill.

Questioned by G. E. Shubrooks, the speaker said that chromium, nickel, and molybdenum additions are made at the spout. Ni and Cr can be added to the cupola but the loss is high.

A discussion led by H. Hock ended in agreement that cast iron should be welded only as an emergency.

Transactions Index Available

Copies of the index to Volume 22 of *Transactions*, January to December, 1934, may be had on request from A.S.M. headquarters, 7016 Euclid Ave., Cleveland, Ohio.

President's Night Is Also Ladies' Night in Chicago

Reported by J. C. Patton

Chicago Chapter, Jan. 10—The annual National President's night was also designated as "Ladies' Night."

The first speaker of the evening was National President B. F. Shepherd, who gave us a brief resume of the advantages of belonging to the Society. Fitting tribute was paid to those members who have devoted so much of their time to its progress. Ben also spoke, à la Tom Girdler, of the future of the steel industry, including special or "tailor-made" steels, representing a new field which has just been touched.

Our old friend Bill Eisenman was present, of course. Enthusiastic, helpful, most excellent manager of the Society's national affairs—his personality permeates the whole organization. It was intensely interesting to learn from Bill's own lips the history of his connection with the Society.

As guest and speaker of the evening, we were honored by the presence of Cook County Superior Court Judge John P. McGoorty. His subject, "Control of Crime," gave us an idea of the tremendous amount of energy given to this problem in our city and state.

Arthur Clarage, past national treasurer, introduced the following "face cards": National Vice-President Robert Archer, Past President William Phillips, and our loyal friend and charter member, Ted Barker.

The ladies present received a most royal and warm salute and welcome, and excellent entertainment was enjoyed by about 400.

John Alexander Mathews

Dr. John A. Mathews, vice president and director of research, Crucible Steel Co. of America, died of a heart attack Jan. 11 at his home in Scarsdale, N. Y. Dr. Mathews joined the American Society for Metals in 1917 and has been an honorary member for many years. At one time he was Crucible's president, but resigned this position in order to continue his research work. His career and accomplishments will be reviewed at length in the February issue of *Metal Progress*.

Chapter Courses Bring in Many Memberships

Milwaukee Gains 112 Men Bates Course Is Used

Jumping from 81 to 193 members with the inception of a six-lecture course on metal fundamentals (based on the course prepared by Dr. A. A. Bates and issued from the National office), the Milwaukee Chapter has assumed a "rarin'-to-go" attitude which is expected to place it in the "above 200" class before spring.

Most surprising was the turnout for these lectures. The photograph shows 130 men who came on the worst night of a week-long rain to hear Dr. S. L. Hoyt present the third lecture. Other capacity classes were addressed by H. Etherington, R. Woodward, D. Zuege, J. E. Schoen, J. Fletcher Harper, and J. Houston.

Plans are being laid by Prof. J. E. Schoen, chairman of the Educational Committee, for a spring course of two or three lectures on practical applications, as well as a continuance of the basic course next fall.

Close cooperation of the entire chapter with A. E. Rauch, chairman of the Membership Committee, was responsible for the leap in membership. A concerted drive on Milwaukee's industries was maintained for several weeks prior to the opening of the course. The effects of this drive are still bringing results, even though the course is finished.

Non-Ferrous Class in Chicago

Attendance at Chicago Chapter's non-ferrous course, which ran from Nov. 5 to Dec. 19, averaged 175, according to E. Gammeter, chairman, Educational Committee.

An even larger enrollment is expected for the ferrous course opening Jan. 16 with a lecture on "Heat Treatment of Steel" by Jordan Korp, metallurgical engineer of Leeds & Northrup Co.

Four other sessions wil be conducted by J. P. Gill, Vanadium-Alloys Steel Co., Dr. M. A. Grossmann, Illinois Steel Co., A. J. Scheid, Columbia Tool Steel Co., and H. B. Knowlton of International Harvester Co.

Pitt Has Three Series

Prospects for the next two series of Pittsburgh's three-series lecture course look very rosy, judging from the results of the first series just concluded.

These five lectures were conducted by Howard Scott, metallurgical engineer for Westinghouse Electric & Mfg. Co., on "The Structure of Metals." Mr. Scott was a physicist at the Bureau of Standards for many years, and his name is well known in the technical press, *Transactions* having published several of his papers.

(*continued on next page*)

"Moly" Aids Machining

Reported by F. G. Anderson

Rockford Chapter, Nov. 9—Ralph Wilson of Timken Steel & Tube Co. proved to be a very capable speaker on "The Applications of Molybdenum Steels."

Machining can be performed on molybdenum steels at higher hardness values than on other steels. Distortion during quenching is decreased by the effect of "moly" on the decalescent and recalescent points. Grain size can also be more readily controlled.

Numerous slides were used to illustrate the effect of Mo on physical properties, and a lengthy discussion indicated a keen interest in the subject.

THE REVIEW

Devoted to the interests of the American Society for Metals

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RAY T. BAYLESS ..... *Editor*
M. R. HYSLOP ..... *Managing Editor*

Volume VIII **Cleveland, O., January, 1935** **No. 1**

Great Interest Shown in Chapter Lecture Courses

(*continued from page 1*)

Of the 156 men enrolled in the course at least 89 were new members attracted by these lectures. Average attendancse was 103, and with the exception of one blustery night, the audience usually numbered over 120.

On Jan. 15 F. H. Allison, Jr., opened the second series on "Heat Treatment of Metals" which will last five weeks. Dr. Allison, who was formerly metallurgist for Crucible Steel Co. of America, has recently taken a position as research metallurgist with the United Engineering and Foundry Co.

This will be followed by five lectures on the basic open-hearth furnace presented by Max W. Lightner, metallurgist, Carnegie Steel Co. Mr. Lightner is well qualified to present this subject, having been associated for at least five years with Dr. Herty in the work of the Metallurgical Advisory Board.

Stainless Steel to Be Studied

"Stainless Steels" is the ever popular subject chosen by Philadelphia's Educational Committee, headed by Norman L. Mochel, for the 1935 special evening course.

There will be six lectures by different authorities, the first on Jan. 30 and the sixth on April 3.

With last year's record of over 200 members registered for the lecture course, an even better turnout is expected for this year.

Rested by a long mid-season vacation from their studies, many Clevelanders are expected to register for E. E. Thum's class on "Engineering Alloy Steels," which begins Feb. 25. The last class night was Nov. 26, when Harry D. Churchill, associate professor of mechanics at Case School, presented the last of his six lectures on "Physical Testing of Metals."

Cleveland Enrolls 229

Total enrollment for the course was 229, with an average attendance of 154. Privilege of enrolling was offered to members of the Canton-Massillon Chapter and 16 registered, six of whom finished with perfect attendance records.

Northwest Chapter's Educational Committee is also busy advertising "A Practical Course on Steel"—a series of six lectures presented by an authority in each field, with plant visitations and demonstrations.

Registration is limited to 100 and a fee of $5.00 is charged to non-members of the Society.

$2 Binds Your Transactions

Members who wish to preserve Vol. XXII of *Transactions* in bound form should send their copies to National Headquarters together with $2 which covers the cost of binding in blue cloth to match previous bound volumes.

If any member wants to keep his copies of the issues of Vol. XXII, January through December, 1934, in loose form and yet have a bound volume for his library, a complete bound volume will be supplied for $5, postpaid.

Tool Steels Classified; Properties and Uses Given

Reported by John W. McBean

Ontario Chapter, Dec. 7—The meeting was held in the Royal York Hotel in Toronto and as usual the number of reservations was only about half the number actually present for dinner. Despite this difficulty, Secretary L. E. "Fitz" Fitzpatrick, with his usual alertness, secured the necessary accommodations. It would help materially if the reply cards were mailed promptly on receipt of the meeting announcements.

One of our own members, Harold B. Chambers, metallurgist of the Canadian Atlas Steels, Ltd., spoke in a simple and popular way on tool steels. He classified their compositions, properties, and uses approximately as follows:

I Carbon tool steels
II Alloy steels
  A. Water hardening
    1. Vanadium 0.15 to 0.25% gives finer grain size and greater toughness and retards grain growth on heating.
    2. Chromium 0.5 to 1.5% gives greater strength and depth of hardness, as for ball bearings.
    3. Cr and V together result in greater strength, wear resistance, toughness, and fatigue.
    4. Tungsten, sometimes with Cr and V, gives a very useful fast finishing steel for brass, bronze, and aluminum alloys, and due to its high hardness is also good for machining chilled iron.
  B. Oil hardening, non-shrinking steels for dies, gages, etc.
    1. Carbon 0.9%, manganese 1.5%; sometimes 1% Mn with a little W or Cr.
    2. C 2%, Cr 4% with sometimes a little Mo.
  C. Hot work steels
    1. Low W-Cr-V.
    2. Low Cr steels, sometimes with V.
    3. High W-Cr-V, which gives the best hot work die steel except for maximum resistance to scaling, which is obtained by
    4. Cr 15%, C 2%
III High speed steels
    1. W 18%, Cr 4%, V 1% is the most commonly used.
    2. 18-4-2 plus 0.5 to 1% Mo is coming into favor.
    3. 18-4-1 plus cobalt and
    4. 18-4-2 plus 5 to 8% Co and with Mo. Cobalt has special value for machining hard materials, but its extra cost is not warranted for other work.

Howard Stagg Tells About Causes of Steel Failures

Reported by Elam E. Williams

Indianapolis Chapter, Nov. 12—In one of the committee reports called for by Chairman S. A. Silberman after the dinner, Dr. A. E. Foulk gave a brief explanation of what the Educational Committee is offering in the way of more knowledge about steel and its treatment.

This was followed by an interesting talk on waste and its disposal by C. K. Calvert, superintendent of the sanitation plant.

E. M. Slaughter then introduced the speaker of the evening, Howard Stagg, assistant manager of Halcomb Steel Co., Syracuse. His 25 years with this company gave him a very broad vision of steel and its failures, which formed the subject of an illustrated talk. Mr. Stagg warned about the need for careful design and guarding against stamping and tool marks.

After several questions which were competently answered, the meeting was adjourned.

Chapter Programs; Secretaries' Addresses

BOSTON—H. E. Handy, Saco-Lowell Shops, Biddeford, Maine
Feb. 8—Fatigue of Metals ..J. H. Zimmerman
Mar. 8—Cast Irons .....C. H. Morken

BUFFALO—B. L. McCarthy, Wickwire Spencer Steel Co.
Feb. 14—Grain Size .....H. W. McQuaid
Mar. 14—Non-Ferrous Subject ...O. W. Ellis

CANTON-MASSILLON—L. L. Ferrall, Timken Steel & Tube Co., Canton
Jan. 24—P-F Characteristics ..B. F. Shepherd
Feb. 21—Business Relations ....Felix E. Held
Mar. 21—Swords and Plowshares .....R. W. Pinger

CHICAGO—K. H. Hobbie, Driver Harris Co.
Feb. 14—Heat Treating Automotive Parts .....J. L. McCloud
Mar. 14—Grinding Problems ..H. W. Dunbar

CINCINNATI—N. C. Strohmenger, Tool Steel Gear & Pinion Co.
Feb. 13—Sheet Metal Drawing Dies ....
Mar. 13—Bonded Carbides .....

CLEVELAND—G. T. Williams, Cleveland Tractor Co.
Feb. 4—High Strength Cast Iron..H. Bornstein
Mar. 11—Automotive Manufacturing ....Joseph Geschelin

DAYTON—F. M. Reiter, Dayton Power & Light Co.
Feb. 12—Deep Drawing Dies and Steels ..
Mar. 12—High Speed Cutting Tools .....

DETROIT—Glenn Coley, Detroit Edison Co.
Feb. 11—Welding .....R. E. Kinkead
Soft Soldering .....S. Turkus
Mar. 11—Salt Baths .....W. M. Gager
Brass Die Castings .....Sam Tour

HARTFORD—W. H. C. Berg, Whitney Mfg. Co.
Feb. 12—Fatigue of Metals.....Zay Jeffries
Mar. 12—Cold Work .....J. D. Armour

INDIANAPOLIS—Elam E. Williams, J. D. Adams Co.
Feb.—Aluminum and Its Alloys .....
Mar.—Aircraft Design and Heat Treatment

MILWAUKEE—W. J. Sparling, Chain Belt Co.
Feb. 13—Oxidation of Steel ..C. H. Herty, Jr.

MONTREAL—B. W. Brownrigg, P. O. Box 371, Sta. H.
Feb. 4—.....Walter M. Mitchell
Mar. 4—Mystery Night .....

NEW HAVEN—M. J. Radecki, H. G. Thompson & Son Co.
Feb. 21—Corrosion .....F. N. Speller
Mar. 21—Alloying of Steel .....A. B. Kinzel

NEW JERSEY—J. H. Johnson, Joseph T. Ryerson & Son, Inc.
Feb. 11—Aluminum and Magnesium ....G. D. Welty
Mar. 11—Aircraft Engine Materials ....B. Clements

NEW YORK—T. N. Holden, 1219 Glenwood Rd., Brooklyn
Feb. 18—Low Temperature Properties ... .Robert Sergeson
Mar. 18—Heavy Forgings ..Bradley Stoughton

NORTH WEST—Alexis Caswell, Manufacturers' Association of Minneapolis
Feb. 12—Defects in Steel .....N. L. Deuble

ONTARIO—L. F. Fitzpatrick, Flexible Shaft Co., Ltd.
Feb. 1—Molybdenum .....T. W. Hardy
Mar. 1—.....G. Tisdale

PEORIA—C. B. Rex, Caterpillar Tractor Co.
Feb. 11—Cast Iron .....H. Bornstein
Mar. 11—Tool Steel .....A. J. Scheid

PHILADELPHIA—A. O. Schaefer, The Midvale Co.
Jan. 25—.....E. C. Bain
Feb. 22—Modern Cast Iron ..J. T. MacKenzie
Mar. 1—Cold Working of Sheet..Joseph Winlock
Cold Finished Bars ....J. D. Armour

PITTSBURGH—H. L. Walker, P. O. Box 521, North Side Station
Jan. 24—Transformation of Steel ....E. C. Bain
Feb. 15—Graphite in Cast Iron ....J. T. MacKenzie
Mar. 14—Copper Alloys .....J. L. Christie

RHODE ISLAND—C. G. Peterson, Providence Gas Co.
Feb. 6—Metallurgy of Steel .....
Mar. 6—Cold Heading .....

ROCHESTER—I. C. Matthews, Eastman Kodak Co.
Feb.—.....C. J. Oxford

ROCKFORD—A. C. Mattison, Mattison Machine Wks.
Feb.—.....H. J. French
Mar. 13—Sodium Cyanide .....W. M. Gager

SCHENECTADY—Lyall Zickrick, General Electric Co.
Feb. 26—Vanadium Steel .....Jerome Strauss
Mar. 26—.....S. L. Hoyt

ST. LOUIS—C. A. Mulligan, Ziv Steel & Wire Co.
Feb. 15—Sodium Cyanide .....W. M. Gager
Mar. 15—Zinc and Its Alloys ..W. M. Pierce

TRI-CITY—R. H. Lind, Peoples Light Co., Davenport, Iowa
Feb. 12—Steel Failures .....H. B. Knowlton
Mar. 12—.....Jerome Strauss

WASHINGTON—E. F. Wilson, Naval Gun Factory, U. S. Navy Yard
Feb. 13—.....V. N. Krivobok

WORCESTER—R. R. Tatnall, 38 Parkton Ave.
Feb. 7—High Speed Steels..Cyclops Steel Co.
Mar. 7—Wire Inspection ..A. B. Arganbright

YORK—C. M. Strickler, General Machine Works
Feb. 13—Welding .....Everett Chapman
Mar. 13—Non-Ferrous .....W. S. Girvin

Symposium on Cr, Mo, Ni, V, Held by N. Y. Chapter

Reported by F. H. Clark

New York Chapter, Dec. 17—The December meeting, held at the Pennsylvania Hotel, had for its subject "The Intelligent Use of Low Alloy Steels," a symposium by A. B. Kinzel, chief metallurgist of the Union Carbide & Carbon Research Labs., who discussed the role of chromium; Allan Kissock, vice-president of the Climax Molybdenum Co., who discussed molybdenum; H. J. French of the International Nickel Co., on nickel; and Jerome Strauss of Vanadium Corp. of America, who discussed the role of vanadium.

Mr. Kinzel began the meeting by claiming that chromium is the least expensive element considering the small amounts necessary for certain effects. This explains in part its increased use. Low chromium steels have increased strength and wear resistance and greater susceptibility to hardening regardless of the carbon content, or, stated another way, chromium in ferrite strengthens the lattice.

In his discussion of molybdenum steels, Mr. Kissock said that carbon-molybdenum steels had good creep strength up to 1200° F., that carburized ring gears of S.A.E. 4615 could be made with a predictable distortion, and that a single quench from the box would refine both the case and the core of S.A.E. 4615. He also told of a molybdenum-vanadium gun cast centrifugally that has as satisfactory physical properties as a forging.

Mr. French spoke of the role of nickel in retarding reaction rates of steel and of its effectiveness as an element for nitrided steels. For a given carbon content, nickel steels have a higher ratio of fatigue limit to tensile strength than plain carbon steels; for example, if the carbon content is lowered from 0.46 to 0.24% and 2.7% nickel added, the same strength and hardness will result in both cases, but the nickel steel possesses a higher fatigue limit.

Mr. Strauss said that grain size control of certain steels was more easily obtained by substituting vanadium for aluminum.

A prolonged discussion ended somewhat facetiously in the suggestion that a small amount of all these important elements might be used judiciously to improve physical properties of steel used today.

Bostonians Visit Watch Co.

Reported by H. E. Handy

Boston Chapter, Dec. 7—The Chapter was the guest of its chairman, Frederick P. Flagg, at the plant of the Waltham Watch Co., Waltham, Mass. About 125 members and friends spent an enjoyable afternoon going through the various departments of the plant manufacturing watches, clocks, and speedometers, and then sat down to one of Seiler's famous turkey dinners.

Speaker of the evening was D. A. Nemser, consulting engineer, International Nickel Co., who presented a talk on "Alloy Steels." Mr. Nemser spoke on application, heat treatment, and testing, particularly of those alloy steels containing nickel. He used a variety of carburized and heat treated samples to illustrate the application of nickel, nickel-chromium, and nickel-molybdenum steels.

Handbook on Hard Carbides

Thomas Prosser & Son announces a 24-page, 8½ x 11 handbook and catalog on Widia Cemented Carbides, as used in tools, wear-resisting parts, and other similar applications.

This handbook covers method of manufacture, salient characteristics, advantages of cemented carbides, and various grades available and their applications. Recommendations regarding modern methods of use and proper tool design are also given, as well as recommended grinding procedure and brazing instructions.

Copies may be obtained without charge from Thomas Prosser & Son, 15 Gold St., New York City.

Long Discussion on P-F Characteristic

Reported by A. O. Schaefer

Philadelphia Chapter, Nov. 30—The Chapter was honored by a visit of our President, Benjamin F. Shepherd, who addressed the meeting on "The P-F Characteristic of Steel" (reviewed in the next column).

An added feature was an extremely well-taken motion picture showing the routine determination of the P-F characteristic, as performed in the Ingersoll-Rand laboratories, from the forging of the samples to the recording of the results.

This talk brought forth an enthusiastic and prolonged discussion. Some of the members felt that penetration of hardness, coarseness of fracture, and the usual McQuaid-Ehn test are all more closely related than we realize. Mr. Shepherd did not claim to have the answer to this, and admitted that his work to date had merely furnished a method of measuring quantitatively a factor hitherto expressed only with difficulty. The next problem is to apply the results to service.

There was some question as to whether Mr. Shepherd's results had been tied in with dimensional changes in hardening, and with impact. It was the consensus that we are headed for a finer evaluation of steels, with a simplification of methods.

Other questions on what degree of control the steel maker had over the properties described, and whether he would be willing to accept this test in a specification, nearly divided the meeting into two rival camps, but the speaker's genial personality kept the discussion on a good-natured plane.

A large attendance enjoyed an excellent talk and a lively discussion to the last minute.

Cutting Ability Depends on Other Properties of Steel

Reported by G. E. Gregson

Rhode Island Chapter, Nov. 8—In a most interesting and instructive talk, R. B. George, metallurgical engineer, Vanadium-Alloys Steels Co., Latrobe, Pa., discussed the various types of high speed steels and their physical properties, including tensile tests, torsion impact values, and the coefficient of toughness as developed by Emmons.

The effect of thermal conductivity on steel quenched from 2350° F. and drawn at various temperatures was used as a basis for comparison between toughness and cutting efficiency. An increase of 35 to 40% in heat conductivity for drawn specimens over tools in the as-quenched condition was noted, and in a curve shown "Hattori" claims a sharp increase in thermal conductivity between 800 and 1100° F.

Mr. George brought out during discussion that in making good tools, the necessity for a balance between toughness, cutting ability, and/or wearing quality must be kept in mind. The hot hardness of high speed steel as determined by Harder and Grove and its effect on the cutting ability were discussed.

The effect of mechanical work and heat treatment was shown by lantern slides of the microstructure.

The effect and applications of nitriding and cyaniding came into consideration, and the properties, heat treatment, and applications of cobalt-bearing steels were also treated.

Hartford Chapter Plans to Hold Unique Meetings

A noteworthy plan for increasing chapter services and presenting an opportunity for members to become better acquainted, not only with each other, but with the Society's publications, is announced by the Hartford Chapter.

This is a series of monthly discussion groups, open to members only, in which a leader will review some recent articles in *Metal Progress* and *Transactions*, followed by an open discussion.

These meetings will be in addition to the regular chapter meetings and will be held in both Hartford and Bristol: Hartford on Tuesday evening, Jan. 29 and Feb. 26, conducted by D. A. Nemser, International Nickel Co., and in Bristol on Wednesday evenings, Jan. 30 and Feb. 27, conducted by L. A. Lanning of New Departure Mfg. Co.

Shepherd Main Speaker at National Officers' Night

Reported by Geo. P. Halliwell

Pittsburgh Chapter, Nov. 8—Since the third meeting was set aside as "National Officers Night," a number of them were present, along with 76 members at dinner. We regretted, however, that our old friend, "Bill" Eisenman, was not with us.

President B. F. Shepherd was guest of honor and speaker of the evening. His subject was the "P-F Characteristic of Steel," which he explained as simply the relationship existing between the depth of hardness penetration following a McQuaid-Ehn carburizing and the accompanying notched fracture.

A series of ten test standards shows a variation in grain sizes arbitrarily numbered 1 to 10. Mr. Shepherd then showed that by using these samples for comparison, it could be easily determined whether or not a steel was of the type that formed large grains at any definite temperature.

He classified steels as "stable" (little change in grain size or depth of penetration with increase in carburizing temperature), "unstable" (a marked change), and "partially stable" (a marked difference in grain size within the steel with increase in temperature). In the last two types time becomes a factor in the grain size, whereas in the first type time does not appear to change the original grain size.

J. P. Gill led the discussion, which revolved around the question of inclusions and what actually caused grain growth.

Cast Iron Is Thoroughly Covered by H. Bornstein

Reported by H. S. Jerabek

Northwest Chapter, Nov. 13—The members of the Twin City Foundrymen's Association were guests of the Chapter when Hyman Bornstein of Deere & Co., Moline, Ill., spoke on "Cast Iron."

This rather broad subject was covered with remarkable thoroughness. An elementary discussion served as introduction to those less familiar with cast iron. The phases then covered included production methods; effects of alloying elements; heat treatment and malleableizing operations; modern high strength and alloy gray irons; high strength malleable; and physical and mechanical properties.

Some of the newer applications of cast iron were also discussed.

The February issue of *Metal Progress* will contain the announcement of an air draw furnace employing entirely new and revolutionary principles.

Who — What — Where

The Ohio Ferro-Alloys Corp., Canton, Ohio, announces the appointment, effective November 1, of GEORGE W. STARR as general manager of sales. PAUL H. SCHAEFFER has been made his assistant. Both men have been closely identified with the iron and steel industry for many years with both Central Steel Co. and United Alloy Steel Corp., now units of Republic Steel Corp.

From Lindberg Steel Treating Co. comes word that F. A. HANSEN, past chairman of Milwaukee Chapter, has been placed in charge of engineering and production of their new control instruments. Mr. Hansen was general manager of Hevi Duty Electric Co. for seven years and has been associated with Westinghouse Electric and Mfg. Co., General Electric Co., and the Bell Telephone System. He is a leading furnace engineer and supervised the construction of the world's largest electric resistance furnace (12,000 kw.) in 1929.

F. A. Hansen

TORSTEN BERG, metallurgical engineer, Pittsburgh Chapter member, on Dec. 31 left the Pittsburgh Steel Co. at Allenport to become assistant sales manager for the Uddeholm Co. in Sweden.

Cleveland Chapter lost one of its members to Golden Gate, when ROY E. PAINE was transferred from Aluminum Research Laboratories to the Pacific Coast Foundry Division of the Aluminum Cooking Utensil Co., Oakland, Cal.

E. P. POLUSHKIN (New York Chapter, A.S.M.), formerly instructor in metallography at the School of Mines, Columbia University, and lecturer on dental metallurgy at the School of Dentistry, has joined the staff of Lucius Pitkin, Inc., New York, as associate metallurgist with particular reference to research and developments.

M. L. ECKMAN, formerly with Federal Machine & Welding Co., has been chosen to head the research and development department of the Thomson-Gibb Electric Welding Co., Lynn, Mass. Mr. Eckman was at one time associated with Ford Motor Co. and has had broad experience with production welding problems. He has spent considerable time in Europe and is regarded as an authority on advanced welding practice in the leading industrial countries.

The Cleveland office of Steel and Tubes, Inc., announces the transfer of M. B. STEELE, sales engineer, to the New England Division. CHARLES H. REINERT, superintendent of the Brooklyn plant, is going to Youngstown to be assistant superintendent of the electric weld tube mill of the parent company, Republic Steel Corp.

NORMAN F. TISDALE, A.S.Member, formerly with Republic Steel and Titanium Alloy Mfg. Co., is now connected with Molybdenum Corp. of America, Pittsburgh, and has been transferred from the Buffalo to the Pittsburgh Chapter.

Instructor in metallurgy, Department of Chemistry & Chemical Engineering, State University of Iowa, is the new position of JOHN F. ECKEL, a member of the Pittsburgh Chapter formerly at Carnegie Institute of Technology.

From Braeburn, Pa., comes news that E. H. WELKER, president, Welker Machinery Co., Detroit, has been elected to the board of directors of Braeburn Alloy Steel Corp. Tool steel is Mr. Welker's specialty—he served ten years as district manager of the Vanadium-Alloys Steel Corp. in the Detroit district.

A member who writes in to tell us he enjoys the Detroit Chapter meetings is PETER W. UHL, metallurgist, Atlas Foundry Co., Detroit. After he attended Central State Normal School and the College of the City of Detroit, Mr. Uhl's varied career included such occupations as laborer, railway mail clerk, accountant, soldier, teacher. He has also been chemist for Bower Roller Bearing Co. and Timken Detroit Axle Co. His hobbies are radio, repair, and experiments of all kinds, and he is also member of the American Chemical Society, Detroit Foundrymen's Association, and Industrial Chemists Association.

H. D. PHILLIPS has traveled north from Birmingham, Ala., where he was steel foundry superintendent for Stockham Pipe & Fittings Co. to Philadelphia to join the staff of Dodge Steel Co. as metallurgist. The Philadelphia Chapter claims his membership.

Promotion from assistant manager to vice-president and general manager of the Burden Iron Co., Troy, N. Y., has been awarded to O. A. VAN DENBURGH, JR., member of Schenectady Chapter A.S.M., A.S.M.E., National Association of Professional Engineers, and the honorary fraternities Sigma Xi and Tau Beta Pi. After graduation from Rensselaer Polytechnic Institute in 1913 with degree of mechanical engineer, Mr. Van Denburgh went to Cambria Steel Co., Johnstown, Pa., his stay there being interrupted by service with the Ordnance and Chemical Warfare Departments of the Army during the War. He was later with Aluminum Co. of America and the U. S. Navy Bureau of Engineers.

Doehler Die Casting Co. announces the return to the organization of CHARLES PACK as assistant to the president in charge of all research and development. Mr. Pack was with the Doehler Co. from 1911 to 1928, but for the last few years has acted as consulting engineer with the firm of Pack-Morin, Inc. One of the outstanding technicians in the industry, he has installed a number of plants here and abroad, including the first die casting plants in Soviet Russia and Japan.

At a recent A.S.T.M. meeting CHARLES MCKNIGHT of International Nickel Co. was elected chairman of the Committee on Ferro-Alloys. In addition to activities on other A.S.T.M. committees, Mr. McKnight has been an A.S.Member since 1920 and served a term on the executive committee of the New York Chapter. He also belongs to the American Iron and Steel Institute, the Engineering Society of Western Pennsylvania, the A.I.M.E. and the American Association for the Advancement of Science.

D. A. NEMSER, who delivered the talk on alloy steels to the Boston Chapter on December 7, has recently transferred to International Nickel's Development and Research Dept. Nemser was formerly chief metallurgist for Pratt & Whitney Mfg. Co., and is the author of an article in *Metal Progress*, Feb. 1932, describing P & W's heat treatment of small tools. He has also served a term as chairman of the Hartford Chapter.

Another addition to the development and research staff of International Nickel Co. has been announced by A. J. Wadhams, manager. FRED J. WALLS, A.S. Member, past president of the Detroit Foundrymen's Association, member of A.F.A. and A.S.T.M., comes to the Nickel Co. qualified by a metallurgy degree from University of Michigan, 18 years experience as metallurgist for Wilson Foundry Co., an extensive consulting practice, and experience on the staff of Eaton Erb Foundry Co., Detroit. Mr. Walls will concentrate his attention on nickel cast irons, particularly for the automotive and machine tool fields.

Taylor Reviews Steels; Kinkead Talks on Russia

Reported by Carl W. Horack

Golden Gate Chapter, Nov. 19—In place of the regular Coffee Talk, a slow motion picture, with explanations from the operator, of the recent Stanford-University of Washington football game was arranged by Jim Coulter.

Frank B. Drake, acting chairman, then introduced the principal speakers. Howard S. Taylor, instructor in metallurgy at Stanford University, talked on the characteristics of carbon and alloy steels, and reviewed some of the technical papers published on this subject during the past year. He discussed the influence of ferrite and carbide distribution on properties, hardenability, and the effect of various alloying elements on the depth hardening of steel. Mr. Taylor had prepared a number of large charts which he used to bring out many facts in graphical form.

The second talk was given by Donald Kinkead on heat treatment and manufacturing processes in Russia. Upon graduation from Stanford University in 1930, Mr. Kinkead went to Moscow, where he became connected with several machine manufacturing concerns during his two-year stay there, working mainly in the metallurgical and heat treating departments.

Most of the laboratories seemed to be very well equipped, but considerably over-manned, with little cooperation between laboratory and heat treating department. Efficiency and cooperation appeared to be much better in one plant which seemed to be influenced by German practices. Mr. Kinkead's impression was that, although many inconveniences had to be put up with, progress was being made in most fields of endeavor.

High Speed Trains Discussed

Milwaukee Chapter, Nov. 20—This meeting developed into an extended discussion after M. P. Winther of the Pullman Car Co. completed his talk on "High Speed Trains." A. G. Hoppe acted as technical chairman.

As a coffee talk, Forrest Nagler demonstrated in no uncertain terms the effect of a bow and arrow on a stainless steel frying pan. The frying pan came out second best. His experiences in hunting big game as an archer formed an interesting prelude to the evening's program.

Special Sessions Will be Devoted to Pure Research

A system of bi-monthly meetings devoted to pure research and shop practice has been instituted by the Pittsburgh Chapter, according to George P. Halliwell, of the Chapter Executive Committee. These will be in addition to the regular monthly meetings.

The first of these special sessions, held at the Bureau of Mines, was addressed by Dr. M. Gensamer, Metals Research Laboratory, Carnegie Institute of Technology, on "The Plastic Deformation of Iron." This was confined to the crystallographic mechanism of deformation, and involved a discussion of cleavage, twinning, slip bands, and hardening through deformation.

The audience expressed a desire to have Dr. Gensamer continue his talk at a later date by discussing in detail the mechanism of the genesis of preferred orientations.

Walter Otis Krebs, assistant research engineer, Youngstown Sheet and Tube Co., Cleveland Chapter member, died Jan. 6.

Failures in Finished Piece Traced to Poor Treatment

Reported by Elam E. Williams

Indianapolis Chapter, Dec. 10—Senator Jacob Weiss was coffee talker at the dinner at the Antlers Hotel, speaking on "Good Government."

Chairman S. A. Silbermann then called the meeting to order, and called for a few remarks from the various committee chairmen. Mr. R. L. Fitzsimmons, chairman of the Educational Commitee, announced that 50 men had enrolled for the Chapter lecture course.

W. A. Chapin of E. C. Atkins Saw Works very ably presented J. V. Emmons, chief metallurgist, Cleveland Twist Drill Co., a graduate of Case School of Applied Science, who has made some noteworthy discoveries in high speed steel research. Mr. Emmons treated his subject in a very able and lucid manner, as was shown by the animated discussion which followed.

Of particular interest was that part of his talk wherein failures in finished pieces were traced to failures in the treatment. He advocated much care in watching temperatures and especially in tempering high speed steel.

Send in Coupon Below for These Helpful Bulletins

Foundry Pyrometer
A leaflet from Pyrometer Instrument Co. briefly tells the advantages and operation of their Pyro Immersion Pyrometer for foundry use. This compact, self-contained instrument can be operated with one hand. Bulletin Fx-37.

Photocell Pyrometers
Recording potientiometers using a beam of light, a mirror galvanometer, and a photo-electric cell give instantaneous control with high sensitivity and accuracy. The different varieties made by C. J. Taglibue Mfg. Co. are described in a 16-page letter-size booket. Bulletin Fx-62.

Die Steels
Darwin & Milner have two folders on their "Neor" non-deforming high carbon chromium steel and "Patent Cobaltchrome" steel for dies. Properties, applications, and detailed instructions for treatment are given. Bulletin R-127.

Tool Room Furnaces
A series of gas-fired furnaces for general tool room work which will meet the growing demand for an ever widening range of heating operations is the subject of a large sized booklet by Bellevue Industrial Furnace Co. General instructions, a heat treatment chart, and other furnace data are included. Bulletin R-129.

High Grade Bronze
A handsome paper-bound catalog of 32 pages describes Ampco Metal, giving properties and applications of the various grades. Atlas bronzes, which form a lower priced series of alloys, are also described. Bulletin R-130.

Deoscillator
How you can wipe out bothersome temperature lags at small expense is told by Foxboro Co. in a bulletin describing the Deoscillator, an auxiliary control unit which, when operated with the regular pyrometers, gives an anticipating effect to the control action. Bulletin Jx-21.

Pre-Heating Furnace
General heat treating operations up to 1900° F., preheating of high speed steel, annealing and firing of glass are some of the applications listed in American Electric Furnace Co.'s folder on their new model B-20 furnace. Bulletin Jx-2.

Dark Room Layout
A novel card 9¼x13 in. containing suggested arrangements for a photomicrographic dark room has been designed by Bausch & Lomb. Costs for installation are estimated, and on the reverse side are printed rules for using the dark room. Bulletin Jx-35.

Radium Radiography
Advantages of portability, ease of application and manipulation in examination of castings, forgings, molds, weldings, and assemblies are attributed to radium for industrial radiography. Details are given in a booklet issued by Radon Co. Bulletin Jx-56.

Blast Cleaning
A centrifugal machine which cleans castings without the use of compressed air is the subject of Pangborn Corporation's new folder. How and why 1800 lb. of castings can be cleaned in 8 min. at low cost it told. Bulletin Jx-68.

Electric Furnaces
A wealth of information on controlled atmosphere electric furnaces is contained in General Electric Co.'s booklet by that name. Detailed data are given on electric brazing in particular. Bulletin Jx-60.

Multiple Tables
Ten convenient and simple tables in this booklet by Timken Steel & Tube enable the steel user to tell at a glance either how long his stock must be to furnish a definite number of multiples, or how many multiples can be cut from a given length of stock. Bulletin Dc-71.

Fast-Cutting Steel
Bliss & Laughlin, Inc., offer an interesting technical folder on Ultra-Cut Steel, giving performance records of this high-speed screw stock on automatic screw machines. Physical data and microstructures are presented. Bulletin Ob-42.

Stainless Steel Uses
The wide range of applications of Allegheny Metal, best known of Allegheny Steel Co.'s corrosion and heat resistant steels, is pictorially covered in a new and interesting booklet. Bulletin Ob-92.

Everdur
Properties, applications, and forms available of this copper-silicon-manganese alloy are described by American Brass Co. High strength and corrosion resistance, ductility, weldability, workability, and moderate price are some of the advantages featured. Bulletin Dc-89.

Alloy Castings
Compositions, properties, and uses of the high nickel-chromium castings made by The Electro Alloys Co. for heat, corrosion and abrasion resistance are concisely stated in a handy illustrated booklet. Bulletin Fx-32.

Thermit Welding
Metal & Thermit Corp. offers a new booklet showing all the possibilities of Thermit welding, explaining the action, and telling in detail how representative Thermit welds can best be made. Well illustrated and clearly written. Bulletin Ar-64.

High Strength Steel
Cromansil steel, a development of Electro Metallurgical Co., has high strength and good ductility "as rolled" and is thus fine for structural applications where its great strength saves much dead weight. Bulletin Je-16.

Aluminum Alloys
Working facts on aluminum—the properties and heat treatment of both cast and wrought alloys—are briefed for the manufacturer and designer in a booklet by Aluminum Co. of America. An appendix gives tables of physical properties, forms and sizes available. Bulletin Dc-54.

Air for Furnaces
Users of gas or oil-fired furnaces know the necessity for a dependable source of large volumes of air at low pressures. A generously illustrated folder of Spencer Turbine Co. shows why their Turbo-Compressors give unfailing, economical air service. Bulletin Mr-70.

Carburizing Boxes
Driver-Harris Co. devotes a folder to Nichrome cast carburizing boxes. Physical properties at room temperature and under operating conditions are given, as are the advantages of Nichrome castings for such service. Bulletin Jr-19.

Molybdenum in 1934
Climax Molybdenum Co. presents their annual book giving new developments in molybdenum, particularly as an alloy with iron and steel. The engineering data presented are made clear by many tables and illustrations. Bulletin Dc-4.

Atmosphere Furnaces
An interesting folder of Surface Combustion Corp. gives performance data on their atmosphere furnaces in actual production bright annealing of ferrous and non-ferrous metals and carburizing, nitriding, forging and hardening without scale. Bulletin De-51.

Bright Annealing
Electric Furnace Co. tells about their controlled atmosphere furnaces for continuous de-oxidize annealing, bright normalizing and annealing ferrous and non-ferrous metals. Work comes clean, bright and dry from these furnaces. Bulletin No-30.

Liquid Carburizing
E. F. Houghton's Perliton liquid carburizer is the subject of a 23-page booklet. Depth of case, speed of penetration, and other results are well illustrated with graphs and photomicrographs. Nv.-38.

Sheet Iron Primer
The fifth edition of Republic's handsome 64-page booklet which tells the story of modern sheet iron in simple, non-technical language is now available. Gage tables and an interesting glossary of metallurgical terms are included. Bulletin Dc-8.

The Lindberg Control
The Lindberg Control announced a few months ago for electric furnaces is now available for fuel fired furnaces. Controlling the input of fuel fired furnaces eliminates the lag caused by the protecting tube around the thermocouple and results in straight line temperature control. Nv-66.

Multiple Point Records
A circular describing Leeds & Northrup's Micromax Multi-Color 6-point Recorder gives a reproduction of an actual chart in six colors showing how each numeral is printed in a contrasting color, thus avoiding errors and saving time. Bulletin Dc-46-A.

Nickel Cast Iron's Uses
The role of nickel and nickel-chromium cast iron parts in such applications as fabricating sheet metal, pressing and forging is interestingly explained in a new pamphlet of International Nickel Co. Bulletin Ag-45.

Cast Vanadium Steel
Jerome Strauss and George L. Norris have written a technical booklet for Vanadium Corp. of America describing the properties developed by steel castings containing various percentages of vanadium. Bulletin S-27.

Hardness Testing
Men interested in hardness testing may find it worth while to read the recent catalog of Wilson Mechanical Instrument Co. which describes the latest design of Rockwell hardness testers and auxiliary work supports. Bulletin Sp-22.

Carbonol Process
The Carbonol process of carburizing is described in detail in a folder of Hevi Duty Electric Co. Results are said to be quicker, cleaner and better cases at very low cost. Bulletin Jy-44.

Testing with Monotron
Shore Instrument & Mfg. Co. offers a new bulletin on Monotron hardness testing machines which function quickly and accurately under all conditions of practice. Bulletin Je-33.

X-Rays in Industry
General Electric X-Ray Co. has available a profusely illustrated brochure which gives the complete story of the industrial applications of X-Rays, the modern inspection tool. Bulletin Ma-6.

Hardening Furnaces
The C. I. Hayes Certain Curtain electric furnace for the range 1200 to 1850° F. is described in this bulletin. Its applications to hardening of carbon, stainless, and alloy tool steels and to preheating high speed steel are discussed. Nv-15.

Properties of Stainless
Carpenter Steel Co. offers (to manufacturers in U. S. A. only) a handy pocket size slide chart which gives at a glance a summary of technical data on all Carpenter stainless steels. Bulletin Se-12.

Cold Drawn Shapes
Many applications of cold drawn squares and flats are enumerated by Union Drawn Steel Co. in this folder. Sizes, grades of finish, and compositions available are listed. Nv-83.

Neophot
"Neophot" is the name of a new metallograph of radically new design and universal adaptability. Observation and photography at 50 to 2000 x in bright field, dark field, and polarized light are possible with this instrument. A pamphlet distributed by Carl Zeiss, Inc., gives its applications and features, and is well illustrated with beautiful samples of micrographic work. Bulletin Jx-28.

Cyanides and Salts
R & H Chemicals Department of E. I. du Pont de Nemours Co. has a new 28-page manual on the procedure for case hardening, reheating, nitriding, and mottling of steels with cyanides, and on coloring, tempering, and drawing with salts. Nv-29.

Big-End-Up
Gathmann Engineering Co. briefly explains the advantages of steel cast in big-end-up ingots, showing the freedom from pipe, excessive segregation and axial porosity. An 82% ingot-to-bloom yield of sound steel is usual. Bulletin Fe-13.

Reports on Firebrick
Babcock and Wilcox Company offer a very complete set of Service Reports on Insulating Firebrick. These reports contain valuable data on adaptability of refractories and savings possible. Bulletin Ob-75.

Welding Rods
Linde Air Products Co. has published an attractive book which describes in clear, non-technical language the properties, characteristics, and uses of every type of Oxweld welding rod. A fund of reliable general information on welding rods is an important feature of the book. Bulletin Jr-63.

Metallograph
A new 36-page booklet of E. Leitz, Inc., contains all information on the Leitz large Micro-Metallograph, MM1. Excellent photomicrographs are reproduced to show its capacity. Special attention is given to the darkfield illumination feature. Bulletin Se-47.

Pyrometer Accuracy
A thought-provoking folder of Hoskins Mfg. Company explains how the use of Chromel-Alumel for pyrometer lead-wires makes it possible to take full advantage of modern pyrometric instruments. Bulletin Ob-24.

Heat Treating Manual
A folder of Chicago Flexible Shaft Co. contains conveniently arranged information on heat treating equipment for schools, laboratories and shops, and also illustrates the several types of Stewart industrial furnaces. Bulletin Ar-49.

Hard Carbide
An extremely interesting little booklet describes "the hardest material ever produced by man for commercial use." This is boron carbide, and its manufacture, properties, and uses as an abrasive and as a wear resisting material are told by Norton Co. Bulletin Dc-88.

Manual of Pyrometry
Brown Instrument Co. offers an elaborate manual which describes the 50 exclusive features of their potentiometer pyrometer. The book will greatly interest those who must maintain accurate temperature. Bulletin Jr-3.

Localized Heat Treating
American Gas Furnace Co. offers information on production machines for localized hardening, tempering or annealing of tools, saws, springs, screws and machine parts of all kinds, using gas as fuel. Bulletin Ag-11.

The Review,
7016 Euclid Ave., Cleveland

Please have sent to me without charge or obligation the following Literature described in the Jan. issue. (Please order by number only.)

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X-Rays, Magnaflux Tests for Defects

Reported by F. H. Clark

New York Chapter, Nov. 19—This regular meeting was a symposium on non-destructive testing; H. H. Lester, physicist at Watertown Arsenal and Harvard University, discussed "Testing by X-Rays" and A. V. deForest of M.I.T. spoke on "Magnetic Testing."

Dr. Lester said that Dr. Sauveur of Harvard made the first radiographic picture of metal in about 1896. Dr. W. P. Davey described equipment for radiographic work in 1915, but it was not until 1920 that the first 200,000-volt X-ray tube was put into commercial service.

Dr. Lester regards 100% inspection of welds and castings as economically feasible if the value in dollars of the material is high enough. One of the interesting things noticed by Dr. Lester was that cracks generally occur in groups. Also a cavity in the center of a weld is not as serious as one near the surface.

Mr. deForest described his scratch extensometer and the use of "magnaflux" whereby iron filings are shaken on the surface of the previously magnetized part. Cracks cause discontinuities in the magnetic flux and are easily visible. In general, the magnetic field must be applied transversely to the crack.

In the discussion Mr. Kinzel brought out that repair work seldom has to be done on Class I 2-in. welds. He also observed that hydrostatic testing of pressure vessels is most dangerous and that non-destructive testing is a great advantage here.

Tool Steels, Wire Making, Instruments, in 3 Talks

Reported by R. R. Tatnall

Worcester Chapter — At the October meeting S. C. Spalding of the American Brass Co. spoke on selection and application of tool steels, stressing details of purchasing specifications and receiving inspection.

A most successful plant visitation was held in November at the South Works of the American Steel & Wire Co. in Worcester. About 175 members and guests visited the open hearths, rolling mills, and wire mills, as well as the control and research laboratories. Following the plant inspection, a dinner was held, and E. E. Legge, head of the research department, gave a talk on "The Manufacture of Steel Wire," detailing the operations and pitfalls in the making of steel for wire and the conversion of ingots into finished wire.

At the December meeting S. C. Horn of the Foxboro Co. gave a talk on hardening room instruments, outlining the important features of the different types of instruments in use, and showing where trouble was encountered and how it could be remedied or avoided.

New Mill to Be Erected

The mill contract for Youngstown Sheet & Tube Co.'s new cold rolling mill at Campbell has been awarded to Mesta Machine Co., and the steel erection to Fort Pitt Bridge Co., Pittsburgh, it has been announced by Frank Purnell, president.

The mill will begin operation by April 1 with a capacity of 250,000 tons a year and will be an adjunct to the continuous strip mill to be completed Feb. 1 with a capacity of about 600,000 tons. A separate building will house the cold rolling equipment—one 3-stand tandem 4-high finishing unit, two single-stand 4-high mills, continuous annealing, pickling, shearing, and straightening machinery.

Coated Electrodes Are Best

Reported by John W. McBean

Ontario Chapter, Nov. 2—The annual meeting devoted to welding was addressed by H. Thomasson of Westinghouse Co. He showed a series of slides giving figures on tensile and impact values of arc welds, time cost data, and corrosion tests, which would make a valuable reference work if available in printed form. They also illustrated quick test methods used at Westinghouse to check the work of apprentices.

The tests indicated that heavily coated rod, in spite of its higher cost per lb., is more economical than bare rod of the same composition, due to the higher strength of the weld metal, its ductility, homogeneity, and resistance to corrosion. Flux coating, however, has little advantage over bare electrodes.

Corrosion tests with 50% HCl at 160° F. showed a clean, unetched surface of weld metal from coated electrodes, with pitted and spongy parent metal. With bare electrodes the weld was attacked even more than the parent metal.

The heat treating effect of making deep fillet welds in layers was shown by microscopic examination; each layer normalized the one beneath and refined the grain.

Knerr Offers Special Text

Copies of the 160-page special text, "Heat Treatment and Metallography of Steel" (250 illustrations) used in the metallurgy course, Temple University, under the auspices of the Philadelphia Chapter, are available to A.S.Members at $2.50.

Copies may be obtained from Horace C. Knerr, director of the course, 1116 W. Montgomery Ave., Philadelphia, Pa.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912,

Of THE REVIEW of the American Society for Metals, Published bi-monthly at Cleveland, Ohio, for October 1, 1934, State of Ohio, County of Cuyahoga, ss. Before me, a notary public, in and for the state and county aforesaid, personally appeared Ray T. Bayless, who, having been duly sworn according to law, deposes and says that he is the editor of THE REVIEW of the American Society for Metals, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations to wit:

1.—That the names and addresses of the publisher, editor, managing editor, and the business managers are: Publisher, American Society for Metals, 7016 Euclid Ave., Cleveland, Ohio; Editor, Ray T. Bayless, 7016 Euclid Ave., Cleveland, Ohio; Managing Editor, M. R. Hyslop, 7016 Euclid Ave., Cleveland, Ohio; Business Manager, W. H. Eisenman, 7016 Euclid Ave., Cleveland, Ohio.

2.—That the owner is: The American Society for Metals, 7016 Euclid Avenue, Cleveland, Ohio, which is an educational institution, the officers being: President, W. H. Phillips; Vice-President, B. F. Shepherd; Secretary, W. H. Eisenman; Treasurer, Emil Gathmann; Directors, W. B. Coleman, R. S. Archer, E. C. Bain, H. G. Keshian, and W. P. Woodside. All above officers of the American Society for Metals, address at 7016 Euclid Avenue, Cleveland, Ohio.

3.—That known bondholders, mortgagees and other security holders are: none.

4.—That the two paragraphs next above, giving the names of the owners, stockholders and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him. Ray T. Bayless, editor, sworn to and subscribed before me this 1st day of October, 1934.

(Seal) Arthur T. Wehrle, notary public. (My commission expires January, 1935.)

Papers Invited

All members of the Society are cordially invited to submit technical papers to the Publication Committee for its consideration for presentation at the next annual convention, or for publication in *Transactions*, or both.

Information and suggestions for the preparation of manuscripts to be reviewed by the Committee will be sent upon request to the American Society for Metals, 7016 Euclid Avenue, Cleveland, Ohio.

New A. S. M. E. Quarterly

The Applied Mechanices Division of the American Society of Mechanical Engineers, beginning March, 1935, will publish a *Journal of Applied Mechanics*. Technical editor will be J. M. Lessells, Swarthmore, Pa.

The journal will be a quarterly of about 80 pages. It will consist of original papers in general mechanics, elasticity, hydrodynamics, aerodynamics, strength of materials, and thermodynamics, along with book reviews and progress reports of research work in engineering mechanics.

The price will be $5.00 to non-members. Subscriptions may be sent to the American Society of Mechanical Engineers, 29 West 39th St., New York.

Metal Exposition Reviewed

Reported by B. R. Queneau

Northwest Chapter, Jan. 7—The Chapter was fortunate in having both President B. F. Shepherd and Secretary "Bill" Eisenman for the first meeting of 1935. Mr. Eisenman gave a short description of the National Metals Exposition, and then congratulated the Chapter on its record of the past few years, speaking very highly of the efficiency of our secretary, Alexis Caswell.

Mr. Shepherd presented his paper on "The P-F Characteristic of Steel," which is reviewed in another section of this paper.

Steel Payrolls Take 41% of Gross Sales

Payrolls of the steel industry take 41 cents out of every dollar received from gross sales, and are the largest single expense item in steel mill operation, according to figures issued by the American Iron and Steel Institute.

This was revealed by an analysis made of the major expenses from 1924 through 1933 of steel companies representing 75 per cent of the steel-making capacity of the country.

Only 6½ cents of the gross sales dollar during the 10-year period was paid to stockholders as dividends, and only one cent was added to surplus.

Six cents from each sales dollar was charged off for depreciation and obsolescence of equipment and facilities. Tax payments of all kinds took an average of 4½ cents a year during the past ten years. One cent was paid out in interest charges.

The 40 cents remaining from the gross sales dollar after these items had been paid was spent for raw materials and for all the other expenses.

Oxides Affect Grain Growth In Steel Discussion Shows

Reported by Geo. P. Halliwell

Pittsburgh Chapter, Oct. 11—At the second meeting, held in the Keystone Hotel with a dinner for 85 covers, a short talk was given on "Patents."

Dr. M. A. Grossmann was the technical speaker of the evening. His talk on "Grain Size in Steels" followed very closely his paper published in *Transactions*, vol. 21, p. 1079 (Dec. 1933) and his recent convention paper published in the Grain Size Symposium (Dec. 1934 *Transactions*). The most pertinent points emphasized that the ultimate grain size depended upon whether carburizing had taken place above or below the coarsening temperature.

During the discussion which followed, led by H. W. Graham, the general subject of the effect of oxide inclusions upon grain growth was introduced.

PRE-PUBLICATION OFFER

To Members of American Society for Metals Only

(Expires Feb. 22, 1935)

Second Edition

The Book of Stainless Steels

Ernest E. Thum, Editor

Success of this book has already been amazing — a metallurgical best seller! Each of the 75 experts who collaborated in writing the first edition has had an opportunity to revise his material, and 70 pages have been added to the book. . . Ready for delivery during February.

W. H. Eisenman, Secretary
7016 Euclid Avenue
Cleveland, Ohio.

Send me a copy of the 700-page Second Edition, The Book of Stainless Steels, as soon as published. Enclosed is check or purchase order for $4.00 (regular price after Feb. 22, 1935, $5.00).

Member A. S. M.

Address

List of Officers and Executive Committeemen of Chapters for 1934-35 Season

The list below presents chapter officers and executive committee members for the 1934-35 season as obtained from records at National Headquarters on January 23.

BALTIMORE CHAPTER

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Uses of Invisible Waves in Physics and Metallurgy

Reported by O. V. Greene

Lehigh Valley Chapter, Nov. 22—Dr. Gilbert E. Doan, associate professor of physical metallurgy at Lehigh University, addressed the Chapter on "Invisible Rays and Recent Improvement in Metals."

Dr. Doan's presentation covered the basic nature of rays, both visible and invisible. The physics of wave mechanics was described in such an extremely simple and concise manner that even non-technical men in the audience were able to get a clear conception of this subject.

Dr. Doan explained the nature of the very short, high frequency cosmic rays, and of all the intermediate stages to the long, low frequency electric waves. Applications described were the method of locating ore beds by means of the long electric waves, the use of slightly shorter waves in wireless communication and in blind flying, heat waves in physiotherapy, and infra-red rays for photographing long distances and for photography in the dark. A very full explanation was made of the use of X-rays and gamma rays in the study of metallurgy, and the contribution of this method to the examination of metals and alloys was reviewed.

Cleveland Chapter Has New Sustaining Members

Reported by Gordon Williams

Cleveland Chapter, Jan. 7—The Steel-Making Meeting of the Cleveland Chapter offered L. F. Reinartz, works manager, American Rolling Mill Co., as technical speaker. Diners numbered 125 and were later reinforced by 175 more members and guests, making the largest audience of many months.

An added attraction was Sustaining Members' Night. Thanks to the splendid work of Bill White and his committee, who brought in 12 new sustainers this season, the chapter now has 22 of these helpful members.

Coffee talker was Col. Frank A. Scott, former chairman of Warner & Swasey Co. and first chairman of the War Industries Board in 1917. His talk, "The World in Arms," discussed the possibilities of large wars in the near future. His conclusions that the United States would not be able to stay out of a world war, and that, with the rest of the world against us, we could hold our own to a favorable ending, made Col. Scott's talk one of the most absorbing in recent years.

Chairman Ross then introduced the 22 guest representatives of the sustaining member companies, and explained their importance and help to the Chapter. He also presented a summary of the next lecture course on "Engineering Alloy Steels," to be given by E. E. Thum (of *Metal Progress*) starting Feb. 25.

Prof. H. M. Boylston, head of the metallurgy department of Case School, acted as technical chairman and introduced Mr. Reinartz. The speaker briefly reviewed the history of steel melting and then presented in fine detail the practice now used by his company at Middletown. His talk showed us why he is so highly regarded in open-hearth circles, and was eagerly received.

Killed in Auto Accident

Gwynne Evans, former executive committee member, Chicago Chapter, and metallurgical engineer at the Youngstown Sheet & Tube Co., E. Chicago, Ind., was killed in an automobile accident Thanksgiving day.

Fredolf J. Peterson Dead

Fredolf J. Peterson, A.S.Member, Detroit district representative of The Electric Furnace Co., Salem, Ohio, died of pneumonia Dec. 2 after a brief illness. Mr. Peterson, who was born in Sweden 49 years ago and came to this country at the age of 17, has spent 12 of his 15 years with the company in the Detroit district.

Symposium on Grain Size Echoed in Philadelphia

Reported by A. O. Schaefer

Philadelphia Chapter, Jan. 4—Echoes of the Society's symposium on Grain Size are still reverberating about the auditorium of the Engineers' Club, where H. W. McQuaid addressed the Philadelphia Chapter on this subject.

The speaker reviewed the early development of the McQuaid-Ehn test, leading to the present control of melting processes to produce fine or coarse grained steels. The importance of the distinction between normal and abnormal was demonstrated by extensive data on case strengths of carburized parts after simple or complicated heat treatments. The method of controlling the melting process to increase life of parts, simplify heat treatment, and prevent failures was reviewed. The speaker demonstrated his points with well-chosen slides and examples.

The discussion of this talk did not break up until the speaker had to catch a midnight train. Interest centered in melting control methods, particularly in estimating aluminum additions.

The dinner preceding the meeting was addressed by Major Stanley W. Root, regional director of the National Labor Board, on "Industrial Relations and the new Deal."

Keen Discussion Follows Session on Carburizing

Reported by Frank J. Allen

York Chapter, Oct. 11—To a store of pleasant associations with Waynesboro, the Chapter added another enjoyable day. Some arrived early for golf, and gathered at 6:30 with others not so depraved for a splendid turkey dinner.

Along with Chairman Bill Allen were H. D. Northrup, speaker, Past-President Bill Phillips, and Tom Moore of the Philadelphia Chapter.

After dinner, Membership Committee Chairman George J. O'Neill again reported additions to the membership. After a short report on the Chapter's metallurgy class, the meeting was turned over to Jimmy Morrison of Waynesboro.

At the insistence of members Dr. Northrup gave his talk on "Carburizing" for the second successive season. A keen discussion followed.

The first point to be brought up was the amount of stock to be left on the piece for grinding. Jimmy Morrison instanced a job which usually was distorted 0.004 to 0.005 in. in carburizing, the part then being ground to eliminate this distortion. Dr. Northrup thought that enough stock could be left on so that there would be about 0.005 in. hyper-eutectoid case left at the section where the grinding just cleans up; not removing any stock. In this way the eutectoid zone could be exposed for service except at that point and this amount of hyper-eutectoid case would not be seriously detrimental.

Floyd Whalen instigated questioning on grain size. All seemed to agree that No. 7 McQuaid-Ehn grain size was best. No. 3 to 4 will carburize more rapidly than 6 to 8, but cannot be quenched directly from the box.

Dr. Northrup was emphatic on the need for clean compound and gave some directions for packing. He agreed with Jimmy Morrison that the shoebox type cover was better than the clayed cover provided it was an alloy box accurately machined. If not clayed, the cover depended on its weight and fit to keep the box gas-tight.

J. G. Miller brought up the subject of holding distortion to a minimum. Dr. Northrup's dictum was to use thoroughly annealed steel, properly normalize to relieve machining strains, and take care the finish cut is not too heavy.

Dr. Northrup turned the pertinent question of gas for carburizing over to George O'Neill. He has found that natural gas containing more than 80% methane as a rule is not an effective carburizing medium in itself. Gas with 70 to 80% methane and corresponding larger percentage of heavier hydrocarbons is more effective. He believes that CO is not so important as the heavy hydrocarbons.

The efforts of the various members and the Waynesboro Manufacturers' Association combined to stage a successful meeting, brought to a close by the raid on the apple barrel.

Sound Material Essential for Good Seamless Tubing

Reported by F. G. Anderson

Rockford Chapter, Dec. 14—D. W. Duemling of the Globe Steel Tubes Co., in his talk on "The Manufacture of Seamless Tubing," emphasized the fact that sound material, free from seams and impurities, is essential. Steel of poor quality does not withstand the drastic rolling which immediately precedes piercing.

Heavy rolling causes the billets to burst or rupture at the center and the piercing mandrel expands the hole started by the rolls.

The entire procedure of tube manufacture was described in detail by Mr. Duemling and supplemented with moving pictures. The problems related to alloy steels and the recently developed equipment for obtaining uniform wall thickness were also discussed.

Alloy Steel Castings Grouped and Properties Discussed

Reported by Paul S. Lane

Baltimore Chapter, Nov. 26—The meeting was well attended, being enhanced by the introduction of seven new members.

A. C. Jones, Lebanon Steel Foundry, Lebanon, Pa., gave a most interesting talk on "Alloy Steel Castings." Each group of alloy steels was separately treated by means of well-ordered lantern slides, showing first the chemical and physical properties, followed by illustrated structural features, and types of castings made.

Another feature which always arouses interest was the study of causes of service failures. Mr. Jones expressed pleasure in the greater degree of cooperation which is now had between designers and steel castings producers. Corrosion fatigue, heat resistance, and castability were also amply covered.

The change from the usual speaker's dinner to the practice of serving beer and pretzels after the meeting is apparently well received by all, and gives the members a chance to become better acquainted.

Excess Oxygen Helps in Metal Cutting, Says Crowe

Reported by Ernest O. Olds

New Jersey Chapter, Nov. 12—There were 125 members and guests at the 53rd meeting held in the Elk's Club, Newark. J. J. Crowe, engineer in charge of development for Air Reduction Co., spoke on "Metal Cutting," drawing largely from his wide experience in the technical development of this art.

His subject covered the radiograph and pantograph cutting machine which cuts steel as thick as 30 in. with the acetylene torch. The path of the flame is not perpendicular through the piece, but has a slight bend or curve as the flame burns its way through. Distance between the vertical line, and the actual point where the flame or cut leaves the piece is called the drag.

Mr. Crowe stressed the point that 99½% plus oxygen is advantageous, and showed that where the thickness is fixed, a flame of greater purity gives (*a*) greater speed of cutting, (*b*) less drag, (*c*) lower pressure operation, and (*d*) lower gas consumption.

Billets in steel mills can be surface cleaned by means of a special oxy-acetylene torch; this method is much faster and cheaper than using the chipping method for removing scale, cracks, seams, and other defects.

The possibility of surface hardening and localized hardening by means of the torch wherein the flame is used to heat the material, with a water nozzle immediately beyond the flame to quench the heated surface, was discussed. This is sometimes used on large gears and other large machine parts.

There was an interesting discussion on whether or not steel should be preheated before cutting; the reply was that best results can be obtained if the steel is preheated to around 1000°. The discussion also brought out that with localized hardening it is necessary to have a steel which will water harden to the desired degree because no carburizing action takes place here.

It was also shown that the acetylene torch could be used for cutting off large gates and risers on iron and steel castings at a much lower cost than by the usual method of sawing or chipping.

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Krivobok Gives Campbell Lecture for Chicago Men

Reported by J. C. Patton

Chicago Chapter, Nov. 8—The Chapter had the honor and pleasure of hearing Dr. V. N. Krivobok, professor of metallurgy at Carnegie Tech, and recently appointed associate director of research for Allegheny Steel Co.

Dr. Krivobok was author of the Campbell Memorial Lecture on alloys of iron and chromium at the New York Convention last fall, and his delivery of excerpts taken from this mass of data cannot be construed as other than brilliant and intense. Since the lecture was extensively abstracted in *Metal Progress* last November, it will not be reviewed at this time.

W. E. Remmers presided as technical chairman. Dinner was served to about 200, and approximately 275 attended the meeting. A huge expression of thanks and appreciation to Dr. Krivobok closed the evening.

Tools Were Sole Use of Steel

North West Chapter, Dec. 11—The Chapter enjoyed an interesting lecture on high speed steels by J. P. Gill, metallurgist for Vanadium-Alloys Steel Co., Latrobe, Pa. A short history of tool steels was first given, an interesting point being that steel was used solely for tools until the development of the bessemer and open-hearth processes.

The effect of different elements on toughness and cutting ability was given, and the best percentage of each for different purposes noted. A large number of photomicrographs showed the increase in grain size at elevated temperatures and the effect of working in breaking up the segregate. The most satisfactory methods of heat treatment for the different types of tool steels concluded the talk.

Ludlum Branch Manager Dies

A member of the Golden Gate Chapter, Geo. E. Batten, died Jan. 1 after a brief illness. Mr. Batten has been San Francisco manager of Ludlum Steel Co. for ten years.

Properties of Steel Are Controlled by Structure

Reported by Joseph M. Weil

Lehigh Valley Chapter, Dec. 7—At the 4th regular meeting of the season, held at Easton, Pa., J. R. Vilella of the United States Steel Corp. gave an address on "The Significance of the Micrographic Structures in Steel."

Mr. Vilella's wide experience and his extraordinarily fine photomicrographs gave to a "full house" a reliable explanation of microstructures commonly observed.

After discussing the human element always present in the metallographic laboratory, and the frequent misinterpretations caused by it, Mr. Vilella proved that:

1. Properties of steel are more directly and more widely controlled by structure than by any other means.
2. Structure of steel depends primarily on the temperature at which austenite transforms to carbide and ferrite.
3. Practically all the alloying elements, if dissolved in austenite, contribute the property of deep hardenability. This is the result of the fundamental effect alloying elements have in retarding the transformation.
4. Plain carbon steels may be made moderately deep hardening by coarsening the austenite grain size, but inasmuch as large grains are undesirable because of their effect on ductility, it is advantageous to increase hardenability by the judicious use of alloying elements or non-metallic grain growth inhibitors.

Grain Size Papers Available

Twelve papers devoted to grain size of metals presented in two technical sessions at the Annual Convention last October, together with discussions, are printed in the "Grain Size Symposium," a 312-page book which forms the December issue of the quarterly *Transactions*. Extra copies are available from the National Office, 7016 Euclid Ave., Cleveland, at $2.50 each bound in cloth, $2.00 with paper cover, foreign countries $3.00.

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Small Amounts of Arsenic Have Effect on Copper

Reported by J. C. Patton

Chicago Chapter, Dec. 13—A good turn-out of 190 members and guests for dinner increased to about 300 to hear Dr. D. K. Crampton, director of research, Chase Brass & Copper Co. His subject, "Copper and Its Alloys," was most illuminating.

Various types of refined copper alloys were listed, such as Electrolytic Tough Pitch, Furnace Refined Tough Pitch, Lake Non-Arsenical and Lake Arsenical Tough Pitch, Deoxidized Low and Deoxidized High Conductivity, and Oxygen-Free. Such alloying elements as oxygen, silver, arsenic, and tin were considered in their correct alloying proportions. Oxygen occurring as cupric oxide is probably the most important.

Hardness characteristics of copper-oxygen alloys before and after annealing were discussed. Physical properties, including impact values, mass conductivity, comparative densities (also tensile elongation and mass conductivity) were given.

Slides were shown concerning the effects of varying amounts of arsenic on physical properties of hot and cold rolled billets. There was no doubt that silently expressed surprise prevailed when mention was made of minute quantities of silver, oxygen, arsenic, affecting the softening temperatures and physical properties of these copper alloys. When Dr. Crampton spoke of such quantities as 0.007% arsenic appreciably affecting the softening temperature, more than one eyebrow went up in question. That was rather difficult for some steel men to comprehend, since the usual amounts of alloying elements in steel exceed this percentage many times.

Embrittling effect of bismuth was mentioned, and an equilibrium diagram of copper solid solution with ferrite was shown.

Hardening of copper alloys, once considered an art of the alchemist, is now commonly used commercially and is explained as the better known process of age hardening.

Slides also indicated the loss of strength during corrosion tests.

J. W. Scott, technical chairman, then opened the meeting to general discussion.

The coffee talk was given by a representative of the American Airways, Mr. Mace, who showed a talking movie of a flight from Chicago to New York, supplemented by a talk giving some of the high lights of operation, organization, and equipment necessary to safe transportation.

Texas Holds Welding Meet

The First Annual Welding Conference on electric and oxy-acetylene welding will open for two days on Feb. 14 at Texas Technological College, Lubbock, Texas. Lectures, motion pictures, and welding demonstrations will be featured.

No charge will be made for the conference. Inquiries should be addressed to H. F. Godeke, professor of mechanical engineering, Texas Tech, Lubbock, Texas.

Engineering Draftsman!

The United States Civil Service Commission has announced an open competitive examination for the position of Engineering Draftsman (Highway), Bureau of Public Roads, Department of Agriculture. Applications must be on file with the U. S. Civil Service Commission at Washington, D. C., not later than Feb. 18, 1935.

Full information may be obtained from the Secretary of the United States Civil Board of Examiners at the post office or custom house in any city, or from the Commission in Washington.

Magnesium Made in Large Amounts From Mich. Brine

Reported by John W. McBean

Ontario Chapter, Jan. 4—We were favored at the January meeting with a paper on magnesium and its applications by Dr. John A. Gann, of the Dow Chemical Co.

It was rather a surprise to most of us to find that magnesium is obtained in large quantities from a brine which occurs in Michigan. Commercial production of the metal, which is of very recent origin, has resulted in the price dropping in 15 years from $5 to 30¢ per lb.

Obviously, it offers some special advantages, since it is only two-thirds as heavy as aluminum and yet can be given a high tensile strength and yield point in alloys with only small amounts of manganese and aluminum. Such alloys are heat treated at about 750° F., quenched, and given a precipitation treatment at about 350° F.

Crystalline structures and physical properties of different alloys with different heat treatments were shown by slides.

Various phases of foundry practice were illustrated, such as the use of a large amount of flux for purification and protection of the metal. The flux can be used repeatedly.

Owing to the great speed of machining and resultant low cost, it was shown that magnesium alloys can sometimes compete with cast iron on a cost basis.

A number of applications were illustrated and several examples of castings were on display.

Peoria Officers Confirmed; Committees Appointed

Reported by C. B. Rex

Peoria Chapter, Dec. 3—Dinner at the University Club was followed by a business session in which an election was held to confirm the acting officers as announced in the last issue of THE REVIEW.

Chairman Fisher then appointed a Program Committee with H. J. Kicherer as chairman; an Entertainment Committee with M. D. Johnson, chairman; and a Membership Committee, E. P. Kastien, chairman.

Technical speakers were J. W. Bridwell, who spoke on "Common Causes of Spring Failures," and E. J. Fisher, whose subject was "Cold Drawn Steel Spring Wire."

Employment Service

Address answers care of A. S. M., 7016 Euclid Ave., Cleveland, unless otherwise stated

HEAT TREAT FOREMAN: Age 37. Two years college; 15 years in production and tool work; 3 years as steel chemist. Great Lakes region preferred. Box 1-5.

B. S. IN METALLURGY, Penn State College, 1934. One year's experience in steel mill and practical experience in summer vacations. References from employers furnished. Any branch of metallurgical field satisfactory. Box 1-10.

SUPERINTENDENT or General Manager: Graduate in electrical and mechanical engineering and law; age 36. Steel mill experience. Now manager large metal working company which operates own rolling mill. Desires position with steel mill or related industry. Box 1-15.

METALLURGICAL CHEMIST: Age 32, 10 years exp. steel mill production, control, and research; heat treating furnace developments and electric furnace foundry production and control. Aggressive and resourceful. Box 1-35.

STEEL FOUNDRY SUPERINTENDENT or molding foreman: Technical graduate with practical metallurgical experience. Successful record and now employed. Age 38. Location and salary secondary to possibility for advancement with reliable concern. Box 1-20.

TECHNICAL GRADUATE: Degrees of B.S. and M.S., specializing in metallurgy. Married, age 22, wants broader experience. Will accept job anywhere. Box 1-25.

EXECUTIVE with manufacturing and sales experience. Large acquaintance in automotive industry and manufactures of the middle west. Willing to go anywhere. Box 1-40.

Position Open

INDUSTRIAL FURNACE ENGINEER: Man who has had experience designing electric and fuel fired heat treating, ceramic kilns, enameling furnaces, etc. State full particulars, past experience, and salary expected. Box 1-30.

Physical Testing Lectures Good Sequel to Course

Reported by Gordon Williams

Cleveland Chapter, Dec. 10—Two hundred members and guests turned out to hear R. L. Templin of the Aluminum Co. Research Laboratory at the third regular meeting at the Cleveland Club.

Templin's talk on "The Interpretation of Physical Test Data" came as an admirable sequel to the Chapter's course on "Physical Testing of Metals" just concluded. This course, given by Prof. H. D. Churchill of Case School of Applied Science, attracted an average of 154 members for the six Monday nights, and the attendance at the Templin meeting demonstrated that interest in testing has been stimulated in Cleveland.

Dale Cox, business commentator of the *Cleveland Plain Dealer*, gave the coffee talk. His remarks regarding national affairs interested all.

Chairman Ross then introduced Professor Churchill who presented Mr. Templin. The latter's clear diagnosis of the variety of stresses, and his insistence on the application of a test to show desired rather than arbitrary properties in parts and structures, gave a clear insight into the requirements of physical testing. Mr. Templin made clear why the use of substitute tests is acceptable only for control, and deplored the tendency toward the use of the hardness test to determine all manner of characteristics.

Numerous slides and blackboard sketches illustrated all points, and a live discussion followed.

'We Want Beer' Is Tune of Philadelphia Meeting

Reported by A. O. Schaefer

Philadelphia Chapter, Dec. 7—Technical affairs and business were discarded when the Chapter held its Annual Party.

The scene was the Sylvania Hotel. The ingredients were a turkey dinner, smokes, beer, a show, and 339 of the Chapter's 357 members.

Since everyone talked at once, and all the time, the secretary was unable to take any coherent minutes of the occasion. We offer merely the following rather meaningless excerpts.

"I want fish and *no* turkey."
"*We want beer!*"
"Be back in a minute."
"Where's Tom?"
"She's nice."
"Hey, leave that old bird alone, and come over here."
"*We want more beer!*"

A Message to Our Members

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The circulation increase was phenomenal, up 31 per cent in one year—from 4937 in January, 1934, to 6464 in December, 1934—and this was *paid* circulation.

Inquiries

Inquiries more than kept pace—18,210 in 1934—inquiries for literature on metals, equipment and processes. These inquiries included only those made to advertisers *through* METAL PROGRESS—64% of them from men who are buying factors in their organizations. Here is the list of inquiries:

	Number of Inquiries
Stainless Steels	2004
Steels: Carbon, Alloy, Tool, Cold Drawn	3086
Non-Ferrous Metals	1292
Furnaces and Refractories	2957
Heat Treating Materials	1937
Pyrometric Instruments	856
Metallographic and Physical Testing Apparatus	2053
Welding	1085
Heat-Resisting Castings	1224
Abrasives	445
Other Products	1271
Total	18,210

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